

1. A perfusion catheter system for selectively and temporarily delivering perfusion fluid to a branch vessel originating from a host structure, comprising:
  - an elongate body having an efferent end portion, an afferent end portion, a lumen extending therebetween for passage of fluid therethrough;
  - an inflow port at the afferent end portion in communication with the lumen and being configured to be coupled to a perfusion source to receive perfusion fluid; and
  - a hub assembly defining an outflow port at the efferent end portion in communication with the lumen to deliver the perfusion fluid to the branch vessel, the hub assembly being configured for placement over the origin of the branch vessel;wherein the hub assembly provides a water-tight, atraumatic seal with an inner surface of the host structure adjacent the origin of the branch vessel.
2. The system of claim 1, wherein the hub assembly comprises a flexible chamber extending from the efferent end portion of the elongate body, the flexible chamber being surrounded by a conformable contact ring adapted for placement over the origin of the branch vessel.
3. The system of claim 2, further including a spring clamp for applying mechanical pressure on the conformable ring over the origin of the branch vessel.
4. The system of claim 3, wherein the spring clamp comprises a base and an elevated arm extending from the base, the base being configured to seat behind the host structure and around the branch vessel, and the elevated arm being configured to surround and bear down on the contact ring against the inner surface of the host structure.
5. The system of claim 4, wherein the base and the elevated arm are shaped like C-rings.
6. The system of claim 2, wherein the contact ring includes a magnetic insert.

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7. The system of claim 6, further including a magnetic ring for placement on an opposite surface of the host structure behind the contact ring, the magnetic ring being of sufficient strength to effect magnetic attraction of the contact ring against the surface of the host structure for the origin of the branch vessel.
8. The system of claim 2, wherein the contact ring is concave and has a suction channel extending therefrom, the suction channel being attached to a vacuum for applying a vacuum pressure to the contact ring.
9. The system of claim 1, wherein the perfusion source is heparinized blood.
10. A perfusion catheter system for selectively and temporarily delivering perfusion fluid to a branch vessel originating from a host structure, comprising:
  - an elongate body having an efferent end portion, an afferent end portion, and a lumen extending therebetween for passage of fluid therethrough, the afferent end portion being configured to be coupled to a perfusion source to receive perfusion fluid;
  - a hub extending from the efferent end portion and being in communication with the lumen to deliver the perfusion fluid to the branch vessel, the hub being surrounded by a conformable contact ring adapted for placement over the opening of the vessel; and
  - a coupling device for maintaining the conformable contact ring in position;wherein the conformable contact ring and coupling device form a water-tight, atraumatic seal between the hub and an inner surface of the host structure of the branch vessel.
11. The system of claim 10, wherein the hub includes a flexible chamber.
12. The system of claim 10, wherein the coupling device includes a spring clamp for applying mechanical pressure on the conformable contact ring over the opening of the branch vessel.

13. The system of claim 12, wherein the spring clamp comprises a base and an elevated arm extending from the base, the base being configured to seat behind the host structure around the branch vessel, and the elevated arm being configured to surround and bear down on the conformable contact ring.

14. The system of claim 13, wherein the base and the elevated arm are shaped like C-rings.

15. The system of claim 10, wherein the conformable contact ring includes a magnetic insert.

16. The system of claim 15, wherein the coupling device includes a magnetic ring for placement on an opposite surface of the host structure behind the conformable contact ring, the magnetic ring being of sufficient strength to effect magnetic attraction of the conformable contact ring over the opening of the branch vessel.

17. A perfusion device for selectively and temporarily delivering perfusion fluid to a branch vessel originating from a host structure, comprising:

an elongate body having an efferent end portion, an afferent end portion, and a lumen extending therebetween for passage of fluid therethrough, the afferent end portion being configured to be coupled to a perfusion source to receive perfusion fluid;

a hub extending from the efferent end portion and being in communication with the lumen to deliver the perfusion fluid to the branch vessel, the hub being surrounded by a conformable concave contact ring adapted for placement over the origin of the branch vessel; and

a suction channel extending through the elongate body and having a connector port for coupling with a vacuum source, the suction channel being in communication with the conformable concave contact ring for applying a vacuum pressure such that the conformable concave contact ring forms a water tight, atraumatic seal between the hub and the host structure of the branch vessel.

18. The device of claim 17, wherein the hub includes a flexible chamber.

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